

What is claimed:

1. A process for producing conductive polymers by an electrochemical polymerization method, wherein said conductive polymers have deformation property by electrochemical redox, said electrochemical polymerization method is a polymerization method using electrolyte including organic compounds as solvents, and wherein said organic compounds include

(1) chemical bond species selected at least one from a group composed of the chemical bond consisting of ether bond, ester bond, carbon-halogen bond, and carbonate bond and/or

(2) functional groups selected at least one from a group composed of functional groups consisting of hydroxyl group, nitro group, sulfone group, and nitril group

in a molecule, and said electrolyte includes anions which include trifluoromethanesulfonate ion and /or plural of fluorine atoms which bond to central atom.

2. A process for producing conductive polymers as set forth in claim 1, wherein said conductive polymer includes pyrrole and/ or pyrrole derivatives in a molecular chain.

3. A conductive polymer form including a conductive polymer obtained by a producing process as set forth in claim 1 as a resin component.

4. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using a conductive polymer form set forth in claim 3 for a driving part.

5. A pressing device using a conductive polymer form set forth in claim 3 for a pressing part.

6. An electrochemomechanical deformation method deforming a conductive polymer form as set forth in claim 3 by electrochemical redox in

electrolyte.

7. An electrochemomechanical deformation method as set forth in claim 6, wherein electrochemomechanical deformation is conducted under temperature environment of not lower than a room temperature.

8. An electrochemomechanical deformation method as set forth in claim 6, including compounds selected at least one from the group consisting of anions which include trifluoromethanesulfonate ion and/or plural of fluorine atoms which bond to central atom, and sulfonate salt whose carbon number is not greater than 3 in electrolyte.

9. An electrochemomechanical deformation method as set forth in claim 6, including sodium chloride in said electrolyte.

10. Laminates including conductive polymer layers and solid electrolyte layers, wherein said conductive polymer layers includes conductive polymers set forth in claim 3.

11. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using laminates set forth in claim 10 for driving parts.

12. A pressing device using laminates as set forth in claim 10 for a pressing part.

13. A film-like conductive polymer form deforming by electrochemical redox wherein deformation ratio is not less than 5 % in the film face direction.

14. Laminates including conductive polymer-containing layers and solid electrolyte layers, wherein conductive polymers included in said conductive polymer-containing layers are conductive polymers obtained by the process for producing conductive polymers set forth in claim 1.

15. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using laminates set forth in claim 14 for driving parts.

16. A pressing device using laminates set forth in claim 14 for a pressing part.

17. A conductive polymer form deforming by electrochemical redox, wherein electrochemical strain of conductive polymers is not less than 3 % in the length direction.

18. A conductive polymer form deforming by electrochemical redox, wherein electrochemical strain per redox cycle of 20 seconds is not less than 3 % in the length direction.

19. An actuator comprising a moving part, a counter electrode, and electrolyte, wherein the moving portion is obtained by a producing process set forth in claim 1.

20. An actuator comprising an operational part, a counter electrode, and electrolyte, wherein the moving portion deforms by electrochemical redox and the actuator deforms not less than 3 % in the length direction.

21. An actuator comprising an operational part, a counter electrode, and electrolyte, wherein the moving part deforms by electrochemical redox and electrochemical strain of the actuator per redox cycle of 20 seconds is not less than 3 % in the length direction.

22. An artificial muscle using an actuator as set forth in claim 19.

23. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using an actuator set forth in claim 19 for a

driving part.

24. A pressing device using an actuator as set forth in claim 19 for a pressing part.

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25. A process for producing conductive polymers by an electrochemical polymerization method, wherein said conductive polymers have deforming property by electrochemical redox, in said electrochemical polymerization method, trifluoromethanesulfonate ion and/ or anions which include plural of fluorine atoms to a central atom are included in electrolyte, and said electrochemical polymerization method employs a metal electrode as the working electrode on which conductive polymers are formed.

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26. A process for producing conductive polymers as set forth in claim 25, wherein said conductive polymer includes pyrrole and/ or pyrrole derivatives in a molecular chain.

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27. A conductive polymer including a conductive polymer obtained by a producing process set forth in claim 25 as a resin component.

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28. A conductive polymer form including a conductive polymer obtained by a producing process set forth in claim 25 as a resin component.

29. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using conductive polymer forms set forth in claim 28 for a driving part.

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30. A pressing device using conductive polymer forms as set forth in claim 28 for a pressing part.

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31. Laminates including conductive polymer layers and solid electrolyte layers, wherein said conductive polymer layers include conductive polymers are conductive polymers obtained by the process for producing conductive polymers set forth in claim 25.

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32. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using laminates set forth in claim 31 for a driving part.

33. A pressing device using laminates set forth in claim 31 for a pressing part.

34. An actuator comprising a moving part, a counter electrode, and electrolyte, wherein the moving portion is obtained by a producing process set forth in claim 25.

35. An artificial muscle using an actuator set forth in claim 34.

36. A positioning device, a posture control device, an elevating device, a carrier device, a moving device, a regulating device, an adjusting device, a guiding device, or a joint device using an actuator set forth in claim 34 for a driving part.

37. A pressing device using an actuator set forth in claim 34 for a pressing part.